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ABSTRACT

This manual provides curriculum materials for implementing a career exploration class in environmental control occupations within a Practical Arts Education program for middle/junior high school students. Introductory materials include the program master sequence, a list of environmental control occupations, an overview of the competency-based instructional system for practical arts, and narration for a slide-tape presentation. The instructor's guide to the learning activities contains guide sheets for each task assignment sheet; these sheets present objectives, attitudes and values to be developed, checkout activities, recommended references and audiovisuals, notes and suggestions for instruction, and references and necessary tools and equipment. Master copies of learning activities are included. Appendixes include a vocabulary listing, a list of practical arts videotapes, a list of references appropriate for career exploration, and ideas for addressing students with special needs. The six student task assignment sheets are also included. Each contains the following components: an introduction, objectives, learning activities, checkout activities, vocabulary, instruction sheets, and a copy of the instructor's final checklist. Tasks are provided for four families of environmental control occupations: land, water, disposal, and air. (YLB)

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PRACTICAL ARTS

Environmental Control Exploration

Directed By

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Practical Arts Education Unit
Bureau of Vocational Education

1983

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[Student Task Assignment Sheets]

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PROGRAM MASTER SEQUENCE

PRACTICAL ARTS
Environmental Exploration

CODE NUMBER	TITLE	MODULE STOCK NUMBER	SLIDE STOCK NUMBER	TAPE STOCK NUMBER
PA-EC-0	Exploring Environmental Occupations		6-089	6-090
	LAND FAMILY			
PA-EC-1	Reading and Interpreting a Topographic Map	6-091		
	WATER FAMILY			
PA-EC-2	Investigating Water Quality	6-092		
	DISPOSAL FAMILY			
PA-EC-3	Setting Up a School Recycling Program	6-093		
PA-EC-4	Making Recycled Paper	6-094		
	AIR FAMILY			
PA-EC-5	Monitoring Air Quality	6-095		

ENVIRONMENTAL CONTROL OCCUPATIONS

Water Family

- Water Purity Inspector
- Public Water Supply Worker
- Public Health Worker
- Coast Guard Member
- Microbiologist
- Chemical Engineer

Air Family

- Anti-Air-Pollution Equipment Designer and Builder
- Air Pollution Inspector
- Plant Inspector
- Filter Maker
- Environmental Technician
- Allergist
- Industrial Engineer

Land Family

- Mine Inspector
- Ecologist
- Geologist
- Horticulturist
- Conservation Worker
- Park Director
- Forest Ranger
- Landscape Architect
- Game Warden
- Seismologist

Waste Family

- Sanitation Worker
- City Dump Yard Worker
- Sewer Line Worker
- City Engineer
- Industrial Engineer
- Junk Dealer

OVERVIEW OF THE CBVE INSTRUCTIONAL SYSTEM FOR PRACTICAL ARTS

Overview of Program

The purpose of the Practical Arts Education program is to broaden the experiences of middle/junior high school students by providing them with an opportunity to become oriented to the world of work and explore a diversity of career goals in order that they may be better prepared to make decisions on their personal needs and future goals. The Practical Arts program consists of a series of career exploration classes based on the occupational clusters spread over a two-year period. A cruise through each occupational cluster shall include the implementation of three behavioral components or domains.

(A) Cognitive: Students shall survey or cruise the content of the occupational cluster. This survey should include the scope, levels, working conditions, entry requirements, duties performed, opportunities, and related jobs in the occupational cluster.

(B) Psychomotor: Students shall have in each cluster experiences of tasks that will be the same as or similar to those who work in the occupational cluster. These experiences or tasks shall be action oriented, vary with the students' interests, aptitudes, and abilities, and be at various levels of employment within a cluster.

(C) Affective: Students shall receive guidance and the opportunity to systematically apply those knowledges and experiences within the cluster to his/her own interest and abilities, his/her present and future choices, and future occupational decisions and experiences.

The competency-based vocational education curriculum is specifically directed at the psychomotor, activities, experience, or tasks aspect of the Practical Arts program. Teachers are encouraged to augment their lesson plans with cognitive information about the occupational clusters from other sources. The curriuclum here will help specifically in the psychomotor aspect of the program.

Competency-Based Vocational Education

The purpose of this manual is to aid the instructor in implementing a competency-based instructional program. It is intended as a guide and resource for the teacher using CBVE materials. The materials in any occupational area have several common elements, particularly their purpose and their format, which will be discussed later.

Regardless of the delivery system used to implement it, CBVE is based on the concept of competencies. That is to say, it is an instructional system in which: (1) the competencies for specific occupations are built around tasks validated by incumbent workers; (2) instruction is designed around performance objectives based on the worker tasks; (3) students are held accountable for meeting the specified minimum standards of performance required for entry-level jobs.

These instructional materials have been developed by Kentucky teachers. They have attempted to provide relevant learning activities and performance objectives which include: (1) the skills (or tasks) which the student must learn; (2) the conditions under which the student must perform; and (3) the standard or level of achievement to which the student must perform.

The purpose of the Curriculum Unit (CBVE) is to develop and assist the implementation of competency-based instructional materials. The Unit is located at:

1910 Capital Plaza Tower
Frankfort, KY 40601

To facilitate the implementation of CBVE materials, a person has been identified in each vocational region as a CBVE Contact Person. Please address any problems or concerns about your CBVE program to your Regional Contact Person.

By the time you receive your CBVE materials, you should have attended a workshop for teachers implementing CBVE materials. The Inservice Education modules, which were distributed at the workshop, are your greatest source of suggestions for setting up and managing a CBVE program. For more detailed information, consult your inservice modules or your Regional Contact Person.

Using the Instructor's Manual

This Instructor's Manual is divided into two sections: introductory materials and Instructor's Guide to Learning Activities. The introductory materials include, among other things, the Program Master Sequence. It contains a listing of the task assignment sheet and slide/tape titles, code numbers, and stock numbers.

You can use the Program Master Sequence as a quick reference guide to the contents of the instructional program, as well as a checklist for insuring that all materials have been received. The code numbers and stock numbers serve as a guide to ordering additional materials.

The Instructor's Guide to Learning Activities is the heart of this manual, because it contains a brief listing of the contents of each task assignment sheet with suggestions for its use. It is suggested that you insert the corresponding task assignment sheet behind the Guide Sheets so you will have the complete program in one place.

Format is consistent throughout all CBVE programs in that the materials contain the same basic components:

Introduction - tells the student what he/she will learn and why it is important.

Objective - clearly states what the student is expected to know or do, under what conditions, and how well.

Learning Activities - a "road map" for the student to follow in going through the task assignment sheets; list the various activities the student will perform in learning the task.

Instructor's Final Checklist - tells the student and the instructor exactly what the student will be evaluated on in the check-out activity; the instructor uses this sheet to rate the student's performance.

Check-Out Activities - tells the student what he/she will be asked to do for the final test or performance.

The Instructor's Guide Sheets in this manual present the essential information in capsule form. In addition, they list: the recommended references and audio-visuals; attitudes and values to be developed; notes and suggestions for instruction; alternate activities for students; necessary tools and equipment; and space for teacher's notes.

The task assignment sheets are designed to be left intact. Students should be reminded not to write on any of the pages. In some cases, they will be required to obtain duplicates or sheets like the ones shown. These are often student self-checks. They can be filed in a folder and can be obtained as needed.

The Instructor's Final Checklist is another page that should not be written on. It should remain in the task assignment sheet although you may want to make additional copies of it to place in students' folders.

NARRATION FOR SLIDE/TAPE PRESENTATION PA-EC

"Overview of Environmental Occupations"

Slide 1: Overview of environmental occupations.

Slide 2: Why is there a need for environmental occupations?

Slide 3: What types of jobs might be considered environmental occupations?

Slide 4: What job families make up this occupational cluster?

Slide 5: Many environmental jobs have been around for a long time, even before "ecology" and "environment" became household words during the 1960's and 70's.

Slide 6: Our awareness of the environment and of our place in it greatly increased during these years.

Slide 7: So, too, has the importance of these jobs increased as we have attempted to find solutions to some of our environmental problems. Four major aspects of our environment include:

Slide 8: water,

Slide 9: air,

Slide 10: land, and

Slide 11: wastes. Environmental job families may also be divided into the four areas of water, air, land and wastes.

Slide 12: The first job family, water, includes

Slide 13: laboratory and monitoring work performed by chemists, microbiologists and other scientists,

Slide 14: sewage treatment plan operations,

Slide 15: as well as drinking water plant operations.

Slide 16: These workers may be employed at the federal, state or local levels,

Slide 17: in addition to private businesses and industries.

Slide 18: Their overall goal is to maintain or improve quality of water in our environment.

Slide 19: Air is the second job family in the environmental cluster.

Slide 20: Monitoring, control and improvement of emissions from sources such as industries,

Slide 21: utilities,

Slide 22: and vehicles is an important part of the work performed in this cluster.

Slide 23: Engineers, technicians, chemists and inspectors

Slide 24: form the largest part of the workers in this occupational cluster.

Slide 25: These workers are helping to ensure that the air we breathe is healthful rather than harmful to all of us who rely upon it.

Slide 26: The third job family is land. This environmental cluster takes in a wide variety of occupations, including

Slide 27: forestry work,

Slide 28: park work,

Slide 29: horticulture,

Slide 30: and gardening, to name just a few.

Slide 31: The main goals in this job family are management, planning, use and conservation of our land resources.

Slide 32: Solid waste is the final job family in the environmental cluster.

Slide 33: This job family includes sanitation workers who collect wastes from our homes and businesses and transport them to appropriate disposal sites,

Slide 34: landfill technicians involved in the compaction and burial of wastes in sanitary landfills, and finally,

Slide 35: recyclers who process and re-use certain valuable materials from the solid waste stream.

Slide 36: Environmental jobs, like the environment itself, are all around us

Slide 37: and affect many aspects of our daily lives.

Slide 38: These jobs are helping all of us to make wise use of and, in many instances,

Slide 39: to protect our fragile environment.

Slide 4C: This concludes this slide-tape presentation.

INSTRUCTOR'S GUIDE TO LEARNING ACTIVITIES

READ AND INTERPRET A TOPOGRAPHIC MAP

OBJECTIVE

GIVEN a topographic map, topographic map symbols, and five questions about your home location,

READ AND INTERPRET THE MAP TO FIND THE INFORMATION.

YOU SHOULD answer at least three of the questions correctly.

ATTITUDES AND VALUES TO BE DEVELOPED

--Students will realize that there are a variety of maps which present a variety of information. They will learn the information included on a topographic map.

CONTENTS

Instructor's Final Checklist	Learning Activity Number
READ AND INTERPRET A TOPOGRAPHIC MAP	4

CHECK-OUT ACTIVITY

Your teacher will provide five questions about your home location.

Using a topographic map and symbols, find the answers to the questions.

REFERENCE RECOMMENDED FOR ENVIRONMENTAL CONTROL TASKS

Environmental Protection Careers Guidebook

U.S. Department of Labor
U.S. Environmental Protection Agency
Washington, DC 20402

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
	It will be necessary to obtain at least one topographic map which covers your school location and others which cover various sections of your city, town, or community, depending on the quadrangle (region.) However, one map may cover all locations if the sites are all in the same quadrangle. If money is not available for maps, students may draw their own, drawing in railroads, roads, buildings, bodies of water, hills, etc.	Topographic maps and the symbols can be purchased for $2.00 per map from: Department of Economic Development Maps and Publications 133 Holmes Street Frankfort, KY 40601 or U.S. Geological Survey Washington, D.C. 20242	
1	Tape or staple the parts of the map together. Show the class how the state is divided into quadrangles (indicated by the pencil-like lines). Have students identify the quadrangle in which their school and homes are located.	"Index to Published Topographic Maps of Kentucky" (In three parts in this section)	
2	Display the topographic map showing the school location. Make the topographic map symbols available to the students. Have students find the symbols on the map.	Topographic map of school location Topographic map symbols	

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
3	Using the same map of the school location, and symbols, have small groups of students find the answers to the four questions listed in the activity.	See Learning Activity 2	
4	Provide the students with a copy of the Check-Out Activity Sheet. Several students whose homes are in the same general location may work together. Use the Instructor's Final Checklist to evaluate the students' performance.	Topographic maps of home locations Topographic map symbols Check-Out Activity Sheet (Master Copy in this section) Instructor's Final Checklist	

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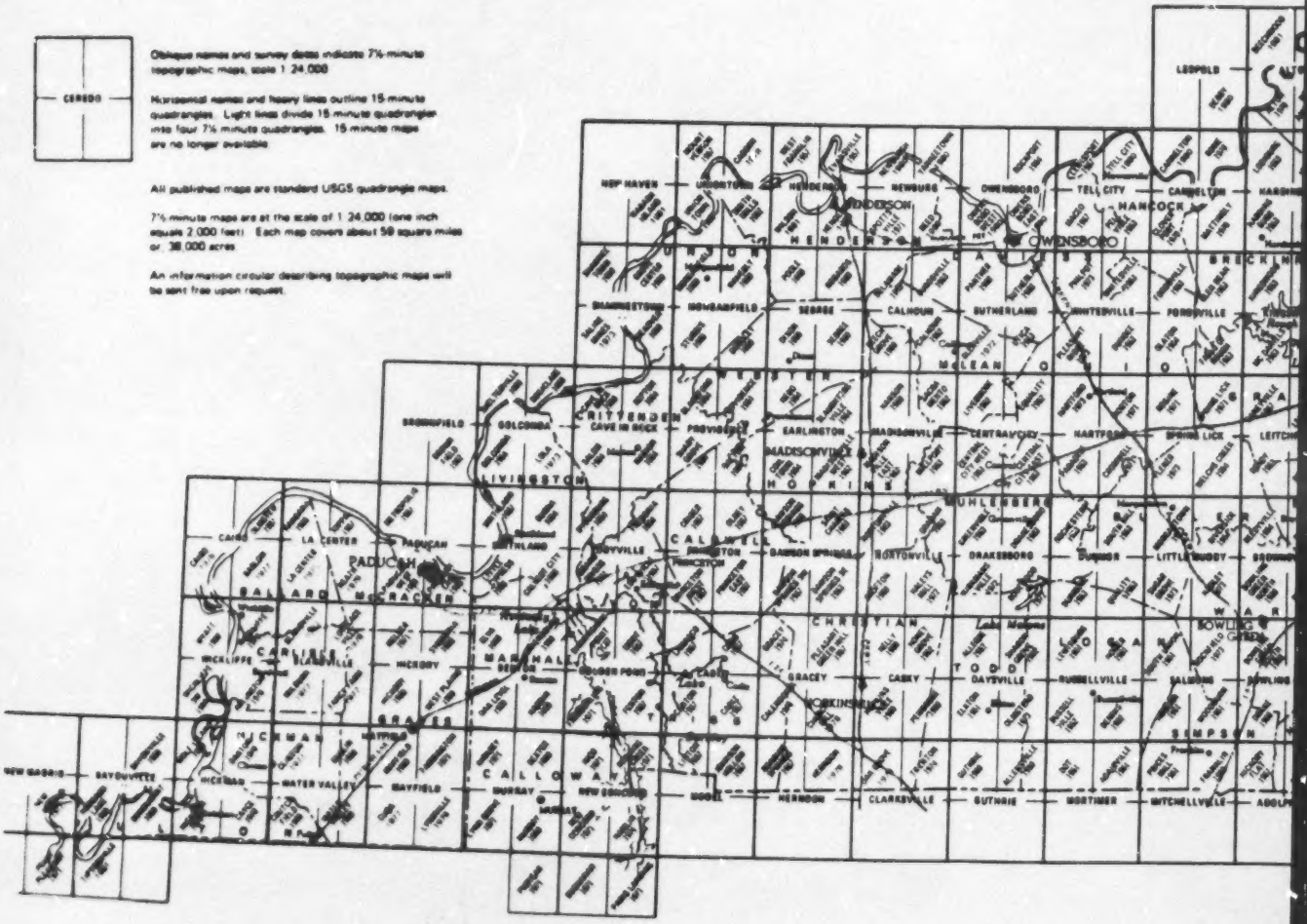
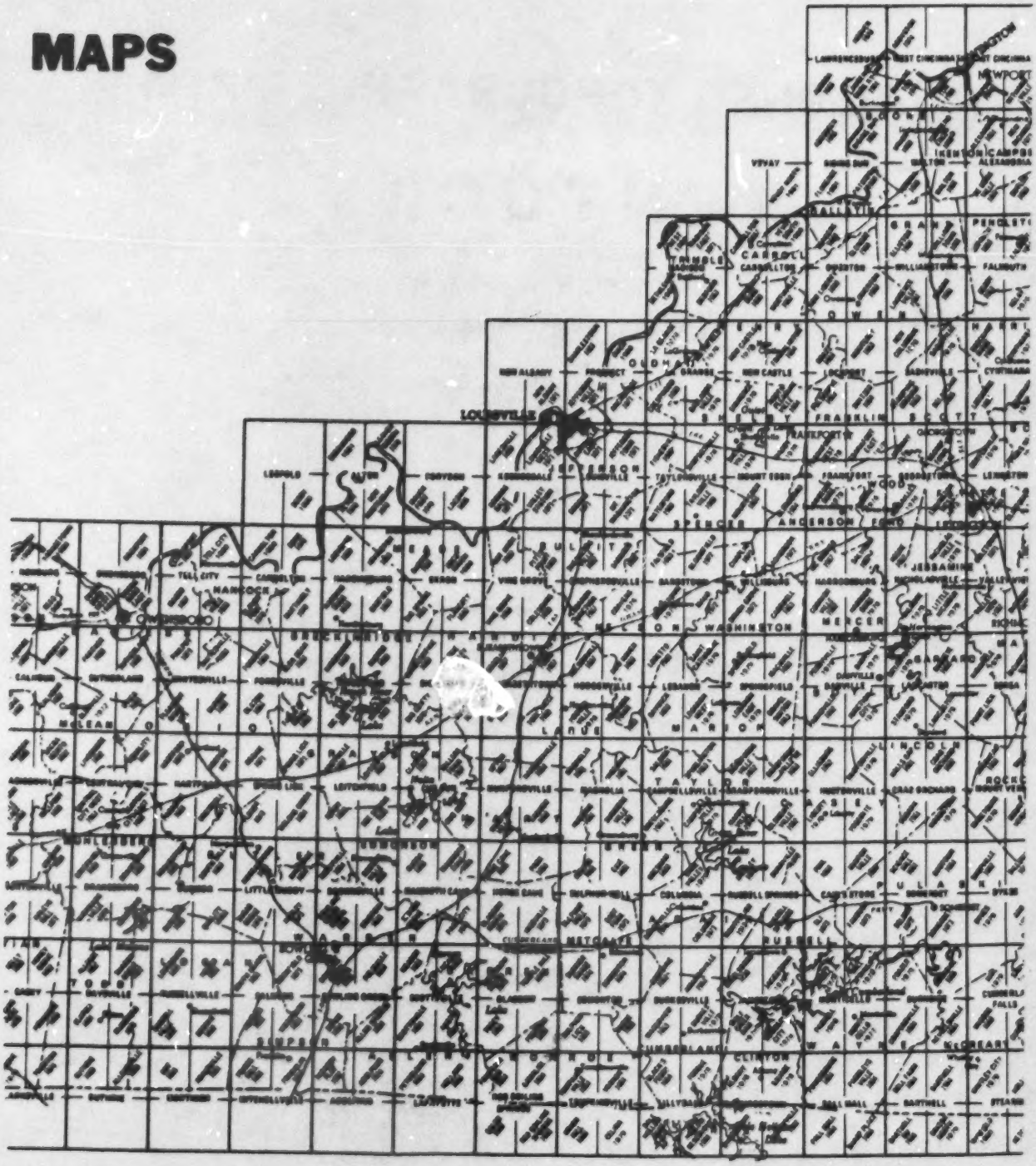
INDEX TO
PUBLISHED TOPOGRAPHIC MAPS
OF
KENTUCKY

TOPOGRAPHIC MAPPING
UNITED STATES GEOLOGICAL SURVEY
in cooperation with
KENTUCKY DEPARTMENT OF ECONOMIC DEVELOPMENT
REVISIONS BY
UNITED STATES GEOLOGICAL SURVEY



MAPS



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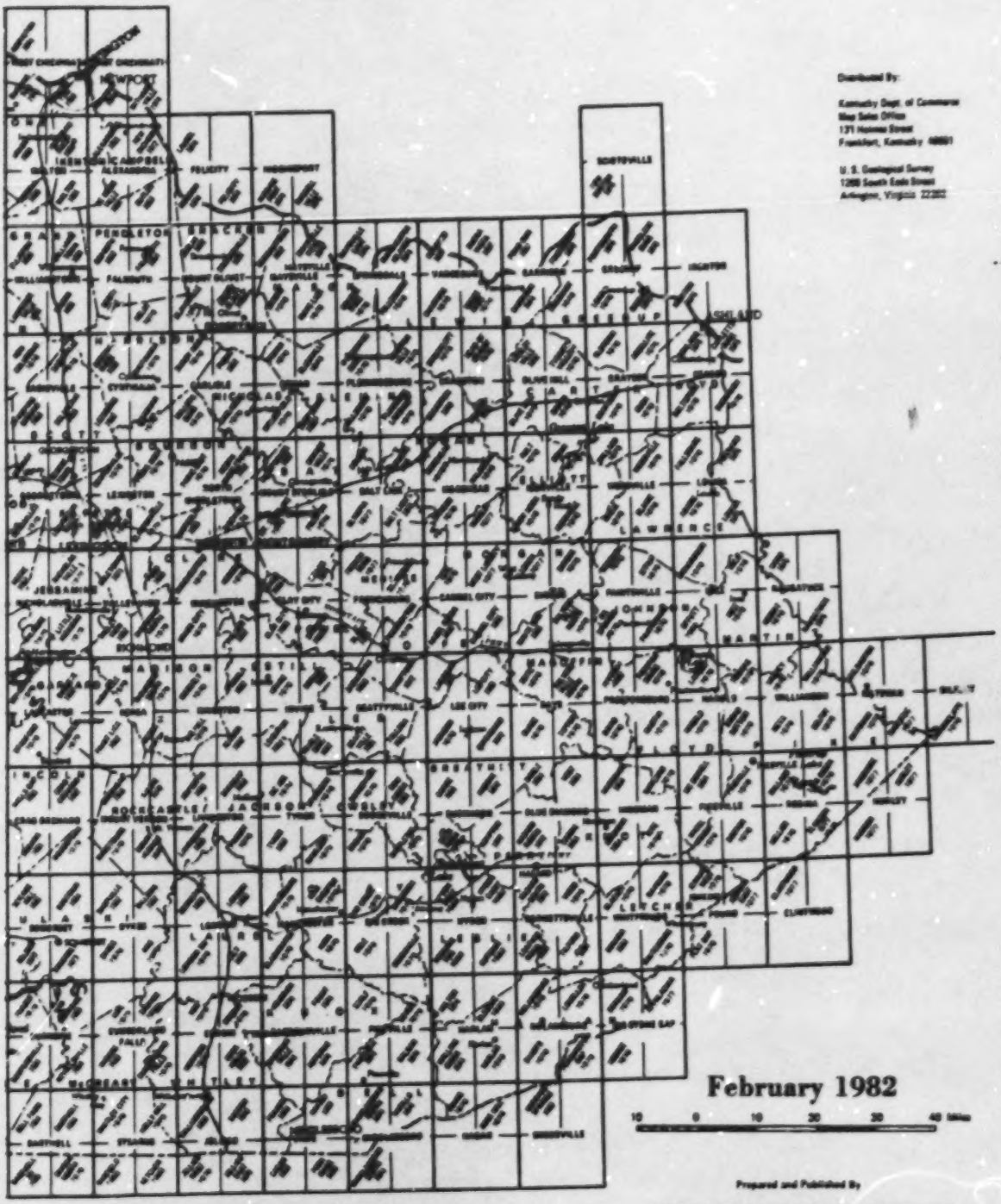

INVESTIGATING WATER QUALITY

OBJECTIVE

GIVEN pH kits, notebooks, and pencils,

INVESTIGATE AND REPORT ON THE WATER QUALITY OF A NEARBY SYSTEM.

YOUR REPORT should describe:

1. Results of the pH measurement.
2. Plant and animal life present in the stream.
3. Pollutants in the water.

ATTITUDES AND VALUES TO BE DEVELOPED:

--Students will realize that water is one of our most precious natural resources and should be protected from pollution.

CONTENTS

	Learning Activity Number
Instructor's Final Checklist	
INVESTIGATING WATER QUALITY	5

CHECK-OUT ACTIVITY

Give an oral or written report on the quality of the water you investigated. Include the pH of the water and what this means, the plant and animal life present, and the pollutants found.

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
	NOTE: It is recommended that you get permission from parents and school administrators for students to go through this task.		
1	Explain to the class the meaning of pH.	Basic chemistry book	
2	Identify a stream of water to investigate. Arrange for the class to visit the stream. Demonstrate for the class how to measure the pH, following the directions in the kit. Provide each student, or pairs of students, pH paper. Have students spread out along the banks of the stream. At each location, the student(s) will dip the paper into the water for the recommended length of time. The color of the paper will probably change. The student(s) then compare the colors with those on the pH chart. This will indicate if the water is basic or acidic. Have students record the results in their notebooks.	pH kits (available at a drug store or school supply store) Stream of water Notebooks and pencils	
3	Have the students survey the stream for plant and animal life.	Stream of water Boots (optional) Notebooks and pencils	

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
	(If boots are not available, the survey may be done from the bank.) Emphasize that the organisms should not be uprooted or disturbed. Have students record the names of the organisms in their notebooks; or, if the names are not known, have them sketch drawings of them. They can then use reference books to identify the organisms.	Standard biology, zoology, or botany books (to help identify plants and animals)	
4	Have students walk the banks to survey for water pollution and record the pollutants in their notebooks.	Stream of water Notebooks and pencils	
5	Have each student, or pairs of students, to report orally or in writing on the results of the investigation of the water quality. Use the Instructor's Final Checklist to evaluate each report.	Instructor's Final Checklist	

SETTING UP A SCHOOL RECYCLING PROGRAM

OBJECTIVE

GIVEN a storage area and necessary supplies,

SET UP A SCHOOL RECYCLING PROGRAM FOR NEWSPAPERS AND ALUMINUM CANS.

THE MATERIALS must be handled in accordance with the policies of the buying recycling company.

ATTITUDES AND VALUES TO BE DEVELOPED

--Students will recognize the wisdom of recycling materials in order to help conserve our energy and natural resources.

CONTENTS

	Learning Activity Number
Instructor's Final Checklist	
SETTING UP A SCHOOL RECYCLING PROGRAM	5

CHECK-OUT ACTIVITY

Sell your items to the recycling company. (Some companies will pick up, and others require that the materials be delivered to them.)

SUGGESTED REFERENCE (teacher)

Operating a Recycling Program: A Citizen's Guide, U.S. Environmental Protection Agency, Washington, D.C. 20406, 1977, publication no. SW-770.

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
	NOTE: PLAN AHEAD: (a) Before you begin this task, make sure there is a market for recyclables in your area. It may pay to shop around. Prices may vary; some may loan out trailers or other equipment, and some will pick up materials. (b) Check with the recycling company on any special handling instructions. For paper, some companies require it be bundled, others will accept it in boxes or grocery bags, while others prefer it loose. For aluminum cans, some companies will accept only cans, while others take household aluminum (pie pans, T.V. dinner trays, etc.) in addition to the cans. Some companies require the cans to be flattened, while others accept them as they are. (c) Make sure that you have a storage area. Newspapers must be stored in a dry place. An outdoor	"Kentucky Recycling Companies" (in this section)	

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
	shed or an empty semi-trailer truck is ideal. (These may be available from the recycling company, provided you sell to them.) If you are uncertain about the fire safety of your storage area, contact your local fire marshal. (Other materials that can be included in a recycling program are cardboard, computer print-outs, mixed paper, and glass.)		
	Divide the class into two groups: newspaper collection and aluminum can collection. Have each group go through the following Learning Activities.		
1	Explain to each group how and where the items will be stored. Take each group on a tour of the storage area.	Storage area for newspapers: Fire safe area Storage for aluminum cans: garbage bags, large barrels, drums or cardboard boxes in outdoor shed or basement.	
2	Have each group make fliers or posters to advertise the program. Students may post these throughout the community.	Poster paper Markers Pictures	

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
3	Have students collect items and place them in the proper storage area. (NOTE: Cans must be all-aluminum and not bi-metal--aluminum on top and bottom with steel or tin sides. To identify all-aluminum cans: (1) check to see if can is marked "all-aluminum;" (2) place a magnet against the side of the can. If it sticks, the can is not all-aluminum.)	Storage areas Magnet	
4	When the storage areas are filled, have students prepare the items for delivery to the recycling company.	Newspapers Aluminum cans Materials necessary for preparing the items as specified by the recycling company	
5	Arrange for the students to sell the items collected. Use the Instrutor's Final Checklist to evaluate each group's work.	Newspapers and aluminum cans prepared for delivery Instructor's Final Checklist	

KENTUCKY RECYCLING COMPANIES

Glasgow

Mid-State Recycling Company
109 Springdale Drive
651-5107

Lexington

Harry Gordon Scrap Materials Inc.
637 Patterson
255-1951

Lexington Scrap Metal Company, Inc.
461 Agnliana
254-1338

Manchester

Beckner Iron and Metal
Town Branch Road
598-2161

London

Brown Iron and Metal Yard
McWhorter Road
864-7608

Madisonville

North 41 Salvage
Highway 82
Hanson
322-8612

Covington Area

Cincinnati Metal Processors Inc.
861 Dellway
Cincinnati
281-4000

Cincinnati Mill Supply Company
861 Dellway
Cincinnati
861-4700

Recyclying Companies (p. 2)

Owensboro Scrap Metal Company, Inc.
1515 East Ninth Street
926-3573

Paducah

South Paducah Scrap Service
Husband Road
442-2416

Frankfort

Frankfort Scrap Metal
223-7607

Prestonsburg

The Appalachian Aluminum Recycling Company
U.S. 23 North
886-1411

Louisville

Reynolds Aluminum Recycling Company
1500 Fern Valley Road
366-0743

Alton Box Board Company, Reclamation Division
750 South Eleventh Street
583-1729

Save-a-Tree Recycling Center
4707 Pinewood Road
966-2767

MAKING RECYCLED PAPER

OBJECTIVE

USING a paper-making frame and paper pulp,

MAKE A PIECE OF RECYCLED PAPER.

YOUR WORK WILL be rated in accordance with the Instructor's Final Checklist.

ATTITUDES AND VALUES TO BE DEVELOPED

--Students will realize that recycling paper helps reduce pollution, conserves natural resources, and saves energy.

CONTENTS

Instruction Sheet	Learning Activity Number
I. HOW TO RECYCLE PAPER	2
Instructor's Final Checklist	
MAKING RECYCLED PAPER	5

CHECK-OUT ACTIVITY

Use the paper-making frame and your paper pulp to make a piece of recycled paper.

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
1	Obtain a sheet of recycled paper and let the class examine it. Discuss the features of the paper: finish, size, shape, consistency, etc.	Recycled paper	
2	Have the class read the procedures for recycling paper. Discuss the materials needed and how they are to be used.	Instruction Sheet I	
3	Divide the class into small groups. Have each group make a paper-making frame.	Thin, flat, pieces of wood (2 yardsticks may be sawed into pieces) Saws Small pieces of screen Staplers	
4	Have each student mix the materials to make paper pulp. (You may decide to have him/her do this at home.) NOTE: Pulp should be refrigerated if it will not be used within a day or two. It will ferment! The ratio of pulp to water is very important. You may want to experiment with it by making a few sheets yourself.	Newspaper Colored construction paper (optional) Cornstarch Measuring cup Blender	
5	Have students make recycled paper. Use the Instructor's Final Checklist to evaluate each piece of paper.	Paper-making screen Paper pulp Large tub or pan Pieces of white felt Sheets of newspaper Instructor's Final Checklist	

MONITORING AIR QUALITY

OBJECTIVE

USING the results of an experiment and a Report Guide,

REPORT ON YOUR COMMUNITY'S AIR QUALITY.

YOUR REPORT should adequately cover the questions outlined in the guide.

ATTITUDES AND VALUES TO BE DEVELOPED

--Students will be aware of the damaging effects of air pollution on human beings, vegetation, and people-made structures.

CONTENTS

	Learning Activity Number
Instructor's Final Checklist	
MONITORING AIR QUALITY	5

CHECK-OUT ACTIVITY

Write a report on your community's air quality. Your teacher will provide a guide which outlines the information you should include. You will need to refer to the map prepared in Learning Activity 4.

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
1	Have students list air pollutants they have noticed in their own community and report to the class.		
2	Have each student fill a jar lid with petroleum jelly, place it outside the house, and leave if for two weeks. (It's a good idea to protect the lids from wind and rain.)	Plastic or metal jar lids Petroleum jelly Outside area (protected from rain)	
3	After two weeks, have students bring their lids to class. Have them separate the lids into categories of "very dirty," "moderately dirty," and "clean." Each student should decide in which category his/her lid belongs.		
4	Have each student locate his/her home site and place a colored pin which represents the condition of his/her lid; e.g., brown for "very dirty," orange for "moderately dirty," and yellow for "clean."	Map which includes locations of all students' homes Colored pins or tacks	
5	Make the guide and map available to all students. Have each student write a report on the quality of air in his/her community, using the guide and map.	Report Guide (Master Copy in this section) Map prepared in Learning Activity 4 Instructor's Final Checklist	

LA#	NOTES AND SUGGESTIONS FOR INSTRUCTION	REFERENCES AND SPECIAL TOOLS AND EQUIPMENT	TEACHER'S NOTES
	Use the Instructor's Final Checklist to evaluate the reports.		

REPORT GUIDE

In your report, you should answer the following questions:

1. Is the air around your home clean, moderately dirty, or very dirty?

2. What are some possible reasons for this? (e.g. - home may be near large factory, power plant, road construction, busy intersection, etc.)

3. Did other students' homes in your area have similar results? Why or why not?

4. Where are the air quality problem areas in your community? Why are these problem areas?

5. What effect do you think the weather had on your results? What results would you expect to have if this activity were done at a different time of the year?

6. What types of controls could be used in your community to help combat air pollution? (Do some research on various types of air pollution controls.)

APPENDIX

VOCABULARY LISTING

Cycle - a complete process of growth or action which repeats itself in the same order. For example, paper is manufactured, used, and thrown away; this is one cycle.

Landfill - the disposal of garbage and rubbish by burying it under a shallow layer of ground.

Monitor - watch; oversee, check.

Particulate - pollutants such as soot, dirt, and dust.

PH - a measurement of water to determine if the quality is basic or acidic (containing acid).

Pollutant - something that makes the air, water, or land unclean.

Pollute - to make unclean or impure.

Polluter - the thing that sends the pollutants into the air and water and onto the land.

Recycle - to pass through a cycle or part of a cycle again, such as scrap paper which is treated and used again.

Topographic map - a map which covers the details of a section of territory--highways, buildings, bodies of water, elevated areas, distance between locations, pipelines, railroads, and other features of the territory.

PRACTICAL ARTS VIDEOTAPES

These videotapes are available through the Kentucky Department of Education, Office of Research and Planning, Division of Materials and Curriculum, 19th Floor, Capital Plaza Tower, Frankfort, Kentucky 40601; Telephone: (502) 564-2000.

Agribusiness, Natural Resources and Environmental Occupations

"Coal: Kentucky's Ace in the Hole": 1/2-inch color cartridge; 23 minutes; some on 1/2-inch reel-to-reel; 2 copies on 3/4-inch cassette. Describes types of occupations available in the coal industry and discusses useful coal by-products.

"Wildlife": 3/4-inch color cassette; 25 minutes. Explains the role of wildlife in conservation.

"Energy Careers": 1/2-inch color cartridge; 15 minutes; some on 1/2-inch reel-to-reel; 2 copies on 3/4-inch cassette. Explores careers in the alternative energy areas of solar energy, wind, and coal liquification.

"Agribusiness": 3/4-inch color cassette; 18 minutes. Deals with careers in agriculture and other farm-related careers.

Business and Office Occupations

"The Secretary": 3/4-inch cassette; 18 minutes. Identifies various careers available in the secretarial field.

Communications and Media Occupations

"One Moment, Please": 1/2-inch color cartridge (2 cartridges available); 18 minutes. Explores occupations, ranging from camera operator to producer, available in radio and television production and necessary qualifications.

"Number, Please": 3/4-inch color cassette; 18 minutes. Discusses careers available in the telephone industry and shows on-the-job interviews for jobs in the industry.

"Roll the Presses": 3/4-inch cassette; 19 minutes, 20 seconds. Gives overview of careers needed to produce a newspaper.

Construction Occupations

"Construction Careers": 1/2-inch color cartridge; 20 minutes; some on 1/2-inch reel-to-reel; 2 copies on 3/4-inch cassette. Explores types of occupations, including carpenters, electricians, and plumbers, in construction careers and necessary skills needed for these careers.

Home Economics Occupations

"Gainful Home Economics": 3/4-inch color cassette; 20 minutes, 45 seconds. Describes occupations related to home economics in which people are gainfully employed.

Health Occupations

"RX Good Health": 1/2-inch color cartridge; 23 minutes; 2 copies on 3/4-inch color cassette. Explores health careers, such as medical secretary, laboratory technician, and physical therapist, in addition to doctor and nurse.

Hospitality and Recreation Occupations

"Hospitality Unlimited": 1/2-inch cartridge tape; 16 minutes; color; also on 1/2-inch reel-to-reel; 2 copies on 3/4-inch cassette. Indentifies careers in the restaurant industry and hotel/motel management.

Manufacturing Occupations

"Down the Assembly Line": 3/4-inch cassette; 18 minutes. Depicts production line workers on the job; introduces students to the division of labor system whereby each worker becomes skilled in a single operation.

Orientation to the World of Work

"The Rest of Your Life": 2/4-inch cassette; 30 minutes. Introduces students to step-by-step procedures necessary in seeking employment.

Personal Service Occupations

"Barbering and Cosmetology": 3/4-inch cassette. Explores careers available in these two areas.

Public Service Occupations

"Dear John Mail": 1/2-inch color cartridge; 20 minutes; 2 copies on 3/4-inch color cassette. Explores the types of postal careers and available postal facilities.

"Law Enforcement": 3/4-inch color cassette; 25 minutes. Presents occupations available in law enforcement careers, ranging from policeman to radio operator, and their functions; also identifies necessary qualifications for entering the occupations.

"The Military": 3/4-inch cassette; 17 minutes, 30 seconds. Gives students an overview of various careers associated with the military.

Transportation Occupations

"Tracking A Trucker": 1/2-inch cartridge tape; 22 minutes; color; some on 1/2-inch reel-to-reel; 2 copies on 3/4-inch cassette. Explores occupations needed to support the trucking industry from mechanic to driver.

"The People of the Airlines": 3/4-inch cassette; 22 minutes. Shows people on the job at the airport and on the airplane.

REFERENCES APPROPRIATE FOR CAREER EXPLORATION

Documents

Exploring Careers, 1979
Bulletin 2001
Bureau of Labor Statistics
1371 Peachtree Street, N.E.
Atlanta, GA 30309
Telephone: (404) 881-4418

Occupational Outlook Handbook
Bulletin 1955
Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402
(Cloth Cover) Stock No. 029-001-02067-8
(Paper Cover) Stock No. 029-001-02059-7

Dictionary of Occupational Titles
Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402
Stock No. 029-013-00079-9

Sources of Information

Practical Arts Unit
Bureau of Vocational Education
21st Floor
Capital Plaza Tower
Frankfort, KY 40601
Telephone: (502) 564-3472

Gregg/McGraw-Hill
Webster Division
1221 Avenue of the Americas
New York, NY 10020

McKnight Publishing Company
Bloomington, IL 61701

New Jersey Vocational Technical
Curriculum Laboratory
Rutgers University
4103 Kilmer Campus
New Brunswick, NJ 08903

Ohio Department of Education
Division of Vocational Education
Career Development Service
Columbus, OH 43215

Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402

Xerox Educational Publications
P.O. Box 16629
Columbus, OH 43216

ADDRESSING STUDENTS WITH SPECIAL NEEDS

Some students may need special help in achieving competencies. Ideas are presented here for helping identify those students and modifying materials and techniques to help them succeed.

Identifying Students with Special Needs

Generally speaking, those students who cannot succeed in the regular vocational education programs without special help are termed "students with special needs" (Vocational Education Act of 1963 and Amendments). Persons most likely to be identified as students with special needs are the academically and economically disadvantaged and the handicapped--the mentally retarded, deaf and hard of hearing, speech impaired, emotionally disturbed, orthopedically (physically) impaired, health impaired, and learning disabled.

The handicapped are further identified as those (1) with a physical or mental disability that substantially impairs one or more major life activities--walking, seeing, hearing, speaking, working, or learning; (2) who have a record or history of such impairment or condition; and (3) who are regarded as having an impairment (Rehabilitation Act of 1973). Women, minorities, the limited English speaking, and others likely to be underemployed or striving for equal opportunity in employment when meeting the criteria for academic or economic deprivation, are specifically identified in the disadvantaged group to be given special help.

Formulating a Basic Approach to Teaching

Society recognizes the right of every individual to an appropriate education, and the law mandates giving persons with special needs an equal chance. In brief:

1. The Vocational Education Amendments of 1976 give special emphasis to developing and providing programs of vocational education for "those with special educational handicaps" and reserves moneys to do so.

2. The Education for All Handicapped Children Act of 1975 assures that all handicapped children between the ages of three to twenty-one have available to them a free, appropriate public education which relates to their unique needs and is provided in the least restrictive environment.

3. The Rehabilitation Act of 1973 prohibits discrimination on the basis of handicap in any program or activity receiving federal financial assistance and directs employers to take affirmative action in hiring handicapped people.

4. The Education Amendments of 1972 prohibit discrimination on the basis of sex in educational programs receiving or benefiting from federal financial assistance.

5. The Civil Rights Act of 1964 prohibits discrimination in employment on the basis of sex, race, color, religion, or national origin in any program or activity receiving federal financial assistance--including training for employment.

We must, then, provide equal opportunity to learn in our instructional processes.

Basically, an approach to teaching which recognizes individual differences in all students provides the best atmosphere for disadvantaged and handicapped students. This approach allows students to work at different rates; involves large group, small group, and individual instruction; incorporates a variety of instructional materials, media, and teaching techniques; and involves a variety of learning activities--reading, doing, discussing, listening, viewing, experiencing, sharing, cooperating, relating, using the senses, etc. It gives disadvantaged and handicapped students the dignity of exploring, learning, and facing the same experiences and responsibilities as other students, without limiting their possibilities by stereotyped concepts of what they can or cannot do.

It involves being organized, with students completely familiar with the teaching/learning plan. When beginning a CBVE class, for example, explain what learning to attain competencies means, how the students will carry out their work, how to use the modules, where to find materials, how and when tests will be given, how "passing" or achieving competency is determined, and what your role as a teacher is.

It also means teacher direction for those students who are not self-directed learners--those with poor academic backgrounds who thrive on teacher interaction and need immediate feedback, instruction simplified, procedures modified, social development as well as specific job skills, role models, or other special aid. For these students, the learning activities described in the modules may become the teacher's lesson plan and be utilized in large-group and small-group settings before the individual student attempts doing learning activities alone. The teacher-directed class might proceed as follows: teacher introduction to tasks to be performed by module or cluster of modules, explanation of what is to be learned and why, presentation of information in small chunks, demonstrations, student tryout and practice, time for questions and answers, trial test followed by reteaching, and evaluation. The teacher will employ a variety of strategies to address the learning needs and styles of the student.

Using Special Strategies

In order to determine the most appropriate teaching strategies, assess the students for kinds of special help required, and develop a plan for meeting any unique needs. Refer to Mainstreaming Guidebook for Vocational Educators by Dahl, Appleby, and Lipe (Olympus Publishing Company, Salt Lake City, Utah 84105), for modifications and general classroom strategies for meeting the unique needs of the different handicapped populations.

Also, enlist the advice and help of employers, support personnel, and agencies and organizations serving disadvantaged and handicapped populations in your school system and geographic area.

Redirecting Teaching Strategies Usually Used

Many of the strategies usually used with regular students may be redirected or modified and also provide effective learning activities for students with special needs. An explanation of how this many be done follows.

AUDIO-VISUALS (films, filmstrips, slide/tape presentations, videotapes, and ETV and commercial television programs). The combination of sight and sound provides more effective communication than either sight or sound alone. Audio-visuals may be used to supplement or replace other methods of presenting information. The hearing impaired will require captioning, signing, or a printed script written at the appropriate reading level or presenting only essential details. The visually impaired may glean information from the sound source, but additional explanation will need to be provided for any visual display of information which is not explained adequately by the narration. Some audio-visual presentations, particularly 8 mm and 16 mm films, may move too fast for the information to be grasped and need to be evaluated with this in mind.

CONTACT WITH WORK ENVIRONMENT. Handicapping conditions, limited finances, geographic isolation, cultural difference, limited communication skills, and social isolation have caused disadvantaged and handicapped persons to have little contact with the world of work. Familiarity with the work setting in which a particular job takes place, relationships with other workers, business use of the telephone, relationship of one's job to other jobs in the same business are just a few examples of areas where special students may require special exposure by means of field trips, spending a day on the job, viewing films, or having additional training sessions.

Note: For those with physical impairments, field trips, on-site job observations, and work experience opportunities will be limited to "accessible" businesses in the community. Before deciding where to go, determine whether the facilities are accessible.

DEMONSTRATION AND TRYOUT. Demonstration by the teacher, experienced workers, and previously-trained students provide reliable role models for learners. Steps, procedures, precautions, physical manipulation, and techniques are imprinted visually in the order and at the time they should occur in task performance. Immediate tryout of the task following the demonstration or an immediate attempt of each step, technique, or procedure as it is demonstrated provides students direct involvement, permits correction and clarification, and promotes retention. Tryout also identifies areas in performance steps, techniques, tools, and work environment where handicapped students need to have modification in order to perform tasks and meet industry standards.

ELIMINATION OF STEREOTYPING. Disadvantaged and handicapped people face more than the sex role stereotyping myths in their quest for employment. The following are just a few examples: "Deaf people are dumb." "The best job for blind people is tuning pianos." "He'll never be able to do that; he's a cripple." "Mr. _____ was no good; neither is his son." "She can

never do that; her parents didn't go to college." In addition to overcoming the unfounded assumptions of others, disadvantaged and handicapped persons often have equal misconceptions about themselves thinking: "I can never do that." "_____, who is deaf, does assembly line work; that's what I'll do, too." "I'll never be anybody."

Overcoming stereotyping may begin with using sex fair instructional materials and media, exploring interests and abilities, exploring two or three nontraditional jobs, or complimenting accomplishments. It may include planning how to reach an educational goal, providing role models (a person with a like handicap or socioeconomic background who has succeeded), as well as observing persons in nontraditional work roles. It means doing whatever raises aspirations and increases self-worth. It means attempting to eliminate underemployment.

EMPLOYER INVOLVEMENT. Programs with employer input are more practical and in line with the current needs of the job market. Employers who make input feel a special kinship to the program and get a chance to see the students before meeting them in the job market.

For disadvantaged and handicapped students, employer involvement offers a very special opportunity to remove common misconceptions about their capabilities. It enables employers to help with any modification needed, see students performing tasks, and observe how the students relate to others. It gives students a chance to prove that they can do the work, that they will not endanger themselves or others, and that they will not increase expenses. These are major employer concerns. Both students and teachers should be prepared to provide reassuring answers and evidence to show there is no more risk than with the nonhandicapped.

Employers may be involved by giving class presentations; giving suggestions for program improvement and modifications; conducting mock interviews; and providing work experience, observations, worker interviews, job analysis, etc.

HANDS-ON EXPERIENCES, PROBLEM SOLVING, PERSONAL INVOLVEMENT (work samples, tryout exercises, games, role playing). Being involved in a sample of work through completing a product, performing related paper work, or role playing interpersonal relationships on the job keeps students interested, holds attention to the learning tasks, and injects the realities of working and job performance in the teaching/learning situation. It makes the student feel that the instruction is practical and valuable. Accomplishment means "qualified for work"--a great boost to self-esteem for those who doubt self-worth.

The instructor and other students should avoid taking over when handicapped students are awkward or slow in completing a task. The student cannot master the skill if someone else does it.

ILLUSTRATIONS (pictures, graphs, bulletin boards, transparencies, and other visuals). The disadvantaged, the mentally retarded, and the hearing impaired, particularly, are especially oriented to visual methods of learning. Other students, with the exception of the blind and some visually impaired, will appreciate visual presentation of information to

be learned. Student handouts, with the steps to a task illustrated and briefly and simply explained, are especially helpful. Captioning and brief explanations are important supplements. Many illustrations may be adapted for the visually impaired by making them tactile (so that they can be felt). Sometimes enlarged print and bold outlines help.

INTERACTION; INDEPENDENCE. Economic deprivation, geographic isolation, cultural isolation, and restrictions on mobility and social relationships imposed by physical impairments have limited the experiences of the disadvantaged and the handicapped in the community at large. Many have no previous work experience, little observation of the worker's daily routine, and limited social experiences. They have been sheltered at home, absent from the scene, and at best, onlookers.

So that they will not continue in this role after vocational training, experiences in the community and involvement with nonhandicapped people and other students are of utmost importance. These students, as well as their families and the working community, need proof that they can function independently and competently. They need to establish contacts who can serve as references to recommend them as competent workers who can relate to others.

Field trips, worker interviews, cooperative work experience, spending a day on the job, giving talks before civic groups are, therefore, important to the acclimation of disadvantaged and handicapped students to the world of work. Participating in team work projects with other students; pairing with a slower or faster learning peer; pairing with a nonhandicapped, a nondisadvantaged, or person from another race or culture will help achieve faster comprehension and understanding and promote learning communication skills. Teaching special units dealing with related communication and social skills will also be necessary; for example: office etiquette, relationships with employer and other employees, daily work expectations which are not direct task performance, telephone skills, appropriate dress and grooming habits, to name a few.

LISTENING (explaining, discussing, reacting orally). Learning by listening is an important tool to the disadvantaged, the visually impaired, the speech impaired, the learning disabled, and others who "prefer to be told" or "have to be told" rather than read about it.

The visually impaired require identification of familiar sounds in the work place to determine location of different work areas, equipment functions, and hazards. The hearing impaired require sight substitutions, such as indicator lights, for critical sounds they cannot hear. They may use lip reading, interpreting, and sound conduction or amplification devices. The retarded need to become accustomed to the sounds of the work place so that they can work without being distracted. The speech impaired need to be given the right to listen although they may have trouble participating, or may not be able to participate orally.

When information is presented for listening, instruction in how to listen (what to listen for) is important. An outline of the information presented, supplemented by visuals, tryout exercises, showing, completion

of a guidesheet questions to be answered, analysis of cases or problem situations, or other application activities will enhance use and retention of information heard.

Listening is a vocational skill as well as a learning skill. Workers must be able to receive information by listening as well as provide information for listening. Most on-the-job instruction is given orally. Explanation must be given to and received from customers, co-workers, and supervisors.

READING HELPS. Being fluent in the technical vocabulary or language of the job and able to read at the level required by the job is a part of occupational competency. On-the-job reading requirements may vary from the reading of signs to following instructions given in technical manuals. The instruction given in reading, then, for vocational purposes, will depend on the reading skills possessed by the student and the reading requirements of the job. Whether or not a supplemental class in remedial reading is offered, the vocational instructor will find that providing reading aids also helps provide job skill.

Braille materials, large print textbooks, magnifying devices, and recordings may be provided for the visually impaired. Materials may be simplified or outlined for the hearing impaired and others with limited language skills. The native language may be supplied above the English for critical information in textbooks used by the limited English-speaking. Familiarity with the setting in which the printed information is applied may be given via field trips, demonstrations, or films to make reading easier and more meaningful.

Students with exceptional reading problems may require the help of a special reading teacher or be enrolled in a remedial reading program. Some schools employ vocational reading teachers to assist vocational students with developing vocational reading skills and doing the reading required in their programs.

RECORDING AND RECORDINGS (tapes, records, radio programs). Information may be presented and gained by listening to recorded information rather than reading. This strategy will aid the nonreader, the poor reader, the visually impaired, the learning disabled, and others through use as a variation of teaching technique. Recording is also a useful tool for the deaf in notetaking; the recording script may be transcribed into print later by a hearing individual. It will also provide instruction for those who have missed initial classroom presentation of information or who need review. Recordings may be supplemented by slides and pictures.

RELATED MATH. Competency in math, like competency in reading, is more critical to some jobs than to others. Math is best taught in relation to the task of which it is a part. This instruction should incorporate basic math and remedial math instruction as needed. A cooperative or team teaching effort with the math teachers or related math instructors in the school will relieve the burden on the vocational instructor. Enough practice and application exercises should be provided to insure retention of the math operations involved. It is helpful to compile a list of the

math competencies needed to complete the training program, prepare an assessment test to determine student skills, and plan in the beginning a program which the student can follow to attain the basic math competencies prerequisite to the course. If the skills cannot be acquired simultaneously to the job skill training program, the student should postpone entry into the course until the prerequisite skills are attained. It may be necessary to prepare a special manual and modules to provide the related math instruction.

REMEDIAL AND RETENTION EXERCISES. Doing learning activities does not necessarily make students occupationally competent. Performance must be observed, misunderstandings clarified, procedures and techniques corrected, and repetition called for at a future time. Lesson planning should anticipate theory and tasks with which students are likely to have difficulty, include additional practice exercises, and provide alternate approaches to teaching. Repetition for retention should be provided, such as repetition of information in different media presentations or use of different types of application exercises. Review sessions, keeping notebooks, completing work samples, doing live work, and solving cases will also help.

SAFETY. The Occupational Health and Safety Act has increased employer concern for safety and underscored the importance of providing safety instruction along with task performance. It is especially important for the handicapped in two ways: (1) to overcome employer concern about the handicapped person's ability to take care of himself/herself and not endanger the lives of others; (2) to identify and deal with situations which are hazardous for persons because of particular handicaps.

To meet these needs for safety instruction, the handicapped student not only needs the basic or general safety instruction related to the occupation but safety instruction or special safety provisions needed for a person with his/her particular handicap. An example is the installation of a blinking light to tell a person who is deaf that the equipment is running.

Note: The Kentucky Department of Labor, Occupational Safety and Health Program, Division of Education and Training, Frankfort, Kentucky 40601, Phone: (502) 564-6895, offers training programs to help vocational instructors teach safety.

SUPPORT SERVICES. Some students will require emotional, social, and financial support in order to succeed in the instructional programs. Others will need career counseling and special assistance in becoming employed. Government agencies, special schools, special personnel, and organizations for disadvantaged and handicapped persons can provide this help. The following are examples and should not be considered an all-inclusive list: resource room teachers, rehabilitation counselors, guidance counselors, tutors, remedial teachers, instructors in special schools, occupational therapists, diagnostic specialists, media personnel, handicapped workers, workers who are members of a minority group, social workers, and others who can serve as role models. Survey the community to identify persons who serve the needs of disadvantaged and handicapped persons in your area and incorporate their assistance in related learning activities.

UNIQUE MODIFICATIONS (modified equipment, tools, learning aids, changes in work environment, adaptations in course or training program content). Some students require special help in meeting physical job requirements. When considering modification, it is important to concentrate on what the student can do. If at all possible, enable the student to function in the work environment as it is usually found. Employers look favorably on handicapped persons with this kind of preparation.

Rehabilitation centers; organizations and schools for the blind, deaf, dyslectic, disabled, and the mentally handicapped; and publishers and manufacturers of special instructional materials, aids, and equipment can offer aid in meeting unique needs. Consultation with special education personnel and rehabilitation counselors is a good starting point. The student should also be asked to make suggestions.

Care should be taken to insure occupational competency. Prospective employers should be shown how the modification operates in the work setting and how it increases efficiency.

The previously described list of strategies is not exhaustive. Others may be added. All will need to be directed toward the occupation for which training is being given, the students enrolled, the availability of instructional materials, and the community. It is also important to remember that what works well for one group of students or a particular student will not necessarily work well for another.

ENVIRONMENTAL EXPLORATION

TASK: READING AND INTERPRETING A TOPOGRAPHIC MAP

INTRODUCTION

It is necessary that a geologist be able to read and interpret various kinds of maps. One of these maps is called a topographic map. In this task assignment sheet, you will learn how to read and interpret a topographic map.

OBJECTIVE

GIVEN a topographic map, topographic map symbols, and five questions about your home location,

READ AND INTERPRET THE MAP TO FIND THE INFORMATION.

YOU SHOULD answer at least three of the questions correctly.

LEARNING ACTIVITIES

1. LOOK AT an index of topographic maps of Kentucky. Your teacher will show you one and explain it to you. IDENTIFY the quadrangle in which your school and home are located.

2. EXAMINE a topographic map and the topographic map symbols. FIND the symbols on the map.

3. USING a topographic map which covers the location of your school, find the following:

   --Your school building.
   --The elevation of the land on which your school is situated.
   --The stream or body of water nearest your school.
   --The main roads near your school.

   Your teacher will work with you on this activity.

4. ARRANGE with your teacher to complete this task by going through the CHECK-OUT ACTIVITY.

CHECK-OUT ACTIVITY

Your teacher will provide five questions about your home location.

Using a topographic map and symbols, find the answers to the questions.

Kentucky Department of Education
Raymond Barber, Superintendent of Public Instruction
1982-83

VOCABULARY

Topographic map - a map which covers the details of a section of territory--highways, buildings, bodies of water, elevated areas, distance between locations, pipelines, railroads, and other features of the territory.

The development of this material is the result of a cooperative effort between the Bureau of Vocational Education and the Office of Research and Planning, Kentucky Department of Education. The Kentucky Department of Education does not discriminate on the basis of race, color, national origin, age, religion, marital status, sex or handicap. This publication was printed with state funds.

INSTRUCTOR'S FINAL CHECKLIST

READ AND INTERPRET A TOPOGRAPHIC MAP

Accomplished	Not Accomplished

Performance Level: All items must receive a rating of ACCOMPLISHED. If any items are rated NOT ACCOMPLISHED, the student and the instructor will decide if any learning activities must be repeated.

In reading and interpreting a topographic map, the students answered at least three of the five questions correctly ..... [ ] [ ]

Practical Arts

ENVIRONMENTAL EXPLORATION

TASK: INVESTIGATING WATER QUALITY

INTRODUCTION

Water is one of our most precious natural resources. Without it, life cannot survive. For this reason, our government pays particular attention to see that our water supply stays useable. Water quality specialists evaluate the quality of water to identify any substances that may be harmful to the user. In this task assignment sheet, you will learn how to investigate water quality.

OBJECTIVE

GIVEN pH kits, notebooks, and pencils,

INVESTIGATE AND REPORT ON THE WATER QUALITY OF A NEARBY STREAM.

YOUR REPORT should describe:

1. Results of the pH measurement.
2. Plant and animal life present in the stream.
3. Pollutants in the water.

LEARNING ACTIVITIES

1. LISTEN to your teacher explain what pH means.

2. GO to a nearby stream. WATCH your teacher demonstrate how to measure the pH. CHOOSE a place along the bank. MEASURE the pH of the stream, and RECORD the results in your notebook.

3. WORK from the bank or go into the water. LOOK FOR plant and animal life. (Be careful not to uproot or disturb these organisms.) RECORD the names of the organisms in your notebook; for example, "algae, moss, cattails, crayfish, minnows, tadpoles." If you do not know the names, SKETCH drawings of the organisms, and then try to IDENTIFY them when you return to the classroom.

Kentucky Department of Education
Raymond Barber, Superintendent of Public Instruction
1982-83

LEARNING ACTIVITIES (Continued)

4. SURVEY the stream for water pollution. WALK the banks and look for evidence of pollutants; for example, "oil, soap suds or foam, litter (bottles, cans, milk cartons, etc.), abandoned vehicles, tires, appliances, etc." RECORD each pollutant in your notebook.

5. ARRANGE with your teacher to complete this task by going through the CHECK-OUT ACTIVITY.

CHECK-OUT ACTIVITY

Give an oral or written report on the quality of the water you investigated. Include the pH of the water and what this means, the plant and animal life present, and the pollutants found.

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VOCABULARY

PH - a measurement of water to determine if the quality is basic or acidic (containing acid).

Pollute - to make unclean or impure.

INSTRUCTOR'S FINAL CHECKLIST

INVESTIGATING WATER QUALITY

Performance Level: All items must receive a rating of ACCOMPLISHED. If any items are rated NOT ACCOMPLISHED, the student and the instructor will decide if any learning activities must be repeated.

	Accomplished	Not Accomplished
The student's report included:		
1. The pH of the stream and what the result means.	[ ]	[ ]
2. The plant and animal life present in the stream	[ ]	[ ]
3. The pollutants present in the stream	[ ]	[ ]

Practical Arts

ENVIRONMENTAL EXPLORATION

TASK: SETTING UP A SCHOOL RECYCLING PROGRAM

INTRODUCTION

Landfill space is decreasing, and energy and natural resources are becoming more expensive. For this reason, recycling is growing in importance. In this task assignment sheet, you will learn how to set up a school recycling program.

OBJECTIVE

GIVEN a storage area and necessary supplies,

SET UP A SCHOOL RECYCLING PROGRAM FOR NEWSPAPERS AND ALUMINUM CANS.

THE MATERIALS must be handled in accordance with the policies of the buying recycling company.

LEARNING ACTIVITIES

You will work with one of two groups: recycling newspapers or recycling aluminum cans. CHOOSE a group and COMPLETE the learning activities:

1. LISTEN to your teacher explain how and where the items will be stored. VISIT the storage area.
2. ADVERTISE your recycling program. DESIGN fliers or posters. POST them throughout your community.
3. REQUEST that your parents, relatives, neighbors, or friends save the items for you. BRING them to school and STORE them in the storage area. (NOTE: Cans must be all aluminum. Your teacher will explain how you can identify cans that are not all-aluminum.)
4. PREPARE the items for delivery to the recycling company when your storage area is filled. FOLLOW any special handling instructions. Your teacher will explain them to you.
5. ARRANGE with your instructor to complete this task by going through the CHECK-OUT ACTIVITY.

Kentucky Department of Education
Raymond Barber, Superintendent of Public Instruction
1982-83

VOCABULARY

Cycle - a complete process of growth or action which repeats itself in the same order. For example, paper is manufactured, used, and thrown away; this is one cycle.

Landfill - the disposal of garbage and rubbish by burying it under a shallow layer of ground.

Recycle - to pass through a cycle or part of a cycle again, such as scrap paper which is treated and used again.

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CHECK-OUT ACTIVITY

Sell your items to the recycling company. (Some companies will pick up, and others require that the materials be delivered to them.)

INSTRUCTOR'S FINAL CHECKLIST

SETTING UP A SCHOOL RECYCLING PROGRAM

	Accomplished	Not Accomplished

Performance Level: All items must receive a rating of ACCOMPLISHED. If any items are rated NOT ACCOMPLISHED, the student and the instructor will decide if any learning activities must be repeated.

The student handled the recycling materials in accordance with the policies of the recycling company:

1.	Acceptable amounts.....	[ ]	[ ]
2.	Acceptable items.....	[ ]	[ ]
3.	Acceptable handling, such as bundling, boxing, bagging, flattening, etc.....	[ ]	[ ]
4.	Acceptable delivery method.....	[ ]	[ ]

Practical Arts

ENVIRONMENTAL EXPLORATION

TASK: MAKING RECYCLED PAPER

INTRODUCTION

Recycling is important because it reduces pollution from solid waste, conserves natural resources, and saves energy. Recycling old paper uses 50 percent less energy than making new paper from trees. In this task assignment sheet, you will learn how to make recycled paper.

OBJECTIVE

USING a paper-making frame and paper pulp,

MAKE A PIECE OF RECYCLED PAPER.

YOUR WORK WILL be rated in accordance with the Instructor's Final Checklist.

LEARNING ACTIVITIES

1. EXAMINE a piece of recycled paper. Your teacher will provide one. DISCUSS the features of the paper.
2. READ and DISCUSS Instruction Sheet 1, HOW TO RECYCLE PAPER.
3. MAKE a paper-making frame. You may work with a small group of classmates.
4. MIX the materials to make paper pulp.
5. ARRANGE with your teacher to complete this task by going through the CHECK-OUT ACTIVITY.

CHECK-OUT ACTIVITY

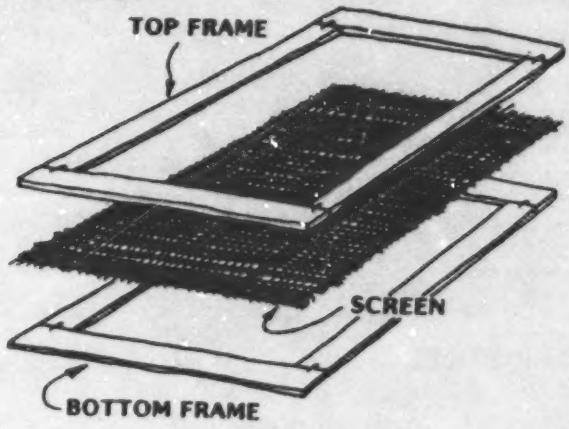
Use the paper-making frame and your paper pulp to make a piece of recycled paper.

Kentucky Department of Education
Raymond Barber, Superintendent of Public Instruction
1982-83

INSTRUCTION SHEET I

HOW TO RECYCLE PAPER

CONSTRUCT

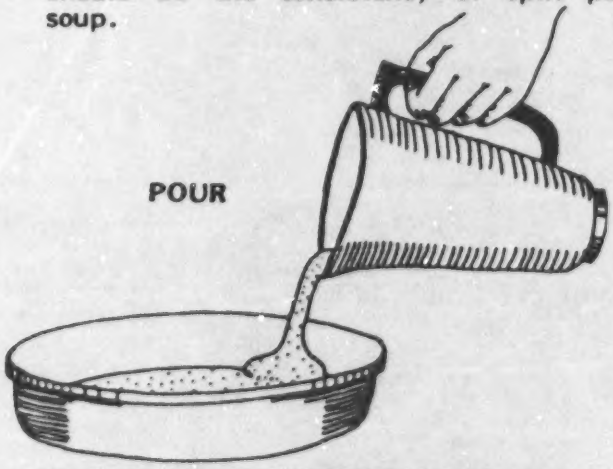


Construct a paper-making frame by sawing yardstick into pieces and stapling corners together on top and bottom. Staple the screen to the bottom frame only.

BLEND

Prepare pulp by tearing newspaper into tiny pieces; put paper into blender and add water (ratio should be about ½ cup shredded paper to 2 cups water). If colored paper is desired, tear pieces of construction paper and add to the mixture. Add 1 tablespoon of cornstarch for strength. Thoroughly blend this mixture until a pulp is formed; the pulp should be the consistency of split pea soup.

POUR



Pour the pulp into a tub or pan (which should be large enough to dip screen into).

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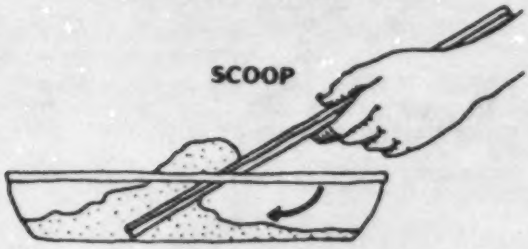
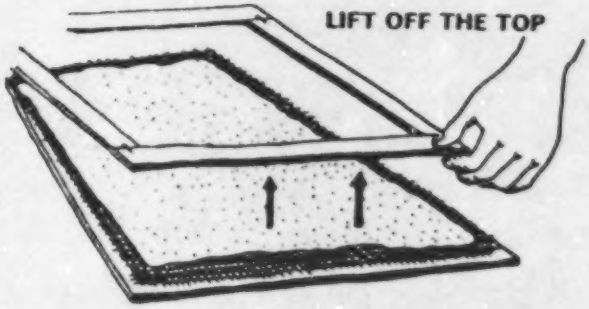
INSTRUCTION SHEET 1, (page 2)

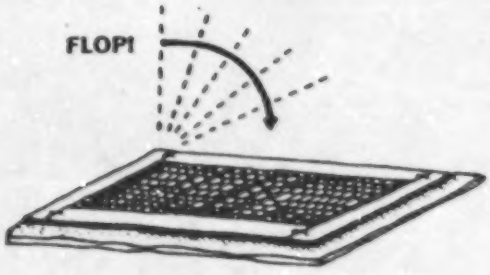


Using the framed screen, scoop up the pulp out of the tub so that most of the water drains off. Make sure the pulp is on evenly and is about 1/6" to 1/8" thick.

Tilt the frame up and wipe off the bottom of the screen to give the paper a smooth finish and to get out excess water.



Lift off the top frame, being careful not to break the edges of the pulp.

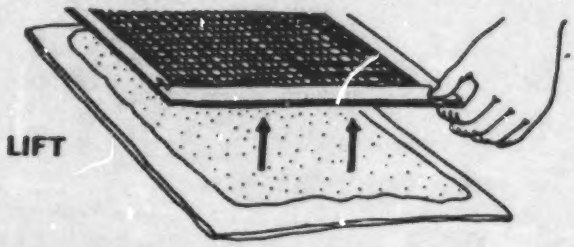


Flop the bottom frame and screen over onto a white felt square and press down with another piece of felt to get out more water.

INSTRUCTION SHEET 1, (page 3)

Carefully lift off the screen. Place the paper on a piece of newspaper and peel off the felt. Let the paper dry for at least 24 hours.

Clean the screen well between uses.



INSTRUCTOR'S FINAL CHECKLIST

MAKING RECYCLED PAPER

Accomplished	Not Accomplished

Performance Level: All items must receive a rating of ACCOMPLISHED. If any items are rated NOT ACCOMPLISHED, the student and the instructor will decide if any learning activities must be repeated.

The student's recycled paper:

1.	Had a smooth finish	[ ]	[ ]
2.	Was the correct size.....	[ ]	[ ]
3.	Was the correct shape	[ ]	[ ]
4.	Was thoroughly dry	[ ]	[ ]

Practical Arts

ENVIRONMENTAL EXPLORATION

TASK: MONITORING AIR QUALITY

INTRODUCTION

Monitoring air quality helps an air pollution inspector identify polluters and pollutants. When these have been identified, air pollution controls can then be put into effect. In this task assignment sheet, you will monitor the air for substances called "particulates" and report on the results.

OBJECTIVE

USING the results of an experiment and a Report Guide,

REPORT ON YOUR COMMUNITY'S AIR QUALITY.

YOUR REPORT should adequately cover the questions outlined in the guide.

LEARNING ACTIVITIES

1. LIST some air pollutants you have noticed in your community. SHARE your list with the class.

2. OBTAIN a plastic or metal jar lid and FILL the inside with petroleum jelly. PLACE it outside your home, preferably on a window sill or a porch. LEAVE your lid there for two weeks.

3. BRING the lid to class. PLACE it in the category which you think is most appropriate: "very dirty," "moderately dirty," or "clean."

4. FIND your home location on a map provided by your teacher. MARK your location with a colored pin or tack to indicate the condition of the air: brown for "very dirty," orange for "moderately dirty," and yellow for "clean."

5. ARRANGE with your teacher to complete this task by going through the CHECK-OUT ACTIIVTIES.

CHECK-OUT ACTIVITY

Write a report on your community's air quality. Your teacher will provide a guide which outlines the information you should include. You will need to refer to the map prepared in Learning Activity 4.

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VOCABULARY

Monitor - watch; oversee, check.

Particulate - pollutants such as soot, dirt, and dust.

Pollutant - something that makes the air, water, or land unclean.

Pollute - to make unclean or impure.

Polluter - the thing that sends the pollutants into the air and water and onto the land.

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INSTRUCTOR'S FINAL CHECKLIST

MONITORING AIR QUALITY

	Accomplished	Not Accomplished
Performance Level: All items must receive a rating of ACCOMPLISHED. If any items are rated NOT ACCOMPLISHED, the student and the instructor will decide if any learning activities must be repeated.		
The student's report adequately covered the questions outlined in the Report Guide.....	[ ]	[ ]